

CLAIMS

1. A method of transmitting a radio signal by use of carrier frequencies, comprising:

generating signals, each signal having a respective one

5 of the carrier frequencies;

amplifying each generated signal;

passing each amplified generated signal having said respective one of the carrier frequencies through a respective variable band-pass filter;

10 controlling a pass band of each variable band-pass filter according to each of said generated signals having said respective one of the carrier frequencies;

combining signals output from said respective variable band-pass filters into a transmission signal;

15 detecting a fault of one of said variable band-pass filters; and

stopping an operation of the one variable band-pass filter having the fault upon detection of the fault.

20 2. The method according to claim 1, further comprising:

varying a bandwidth of the pass band of at least one of said variable band-pass filters based on a transmission rate of the transmission signal.

3. The method according to claim 1, wherein the variable band-pass filters are superconductive filters in a refrigerator.

5           4. The method according to claim 3, further comprising:  
monitoring a power of at least one of said amplified generated signals;

monitoring a temperature of at least one of said superconductive filters; and

10           controlling an operation of the refrigerator based on the at least one monitored power and the at least one monitored temperature.

15           5. The method according to claim 3, further comprising:  
monitoring a temperature of at least one of said superconductive filters; and

controlling an operation efficiency of the refrigerator based on a signal output timing of each amplified generated signal and the at least one monitored temperature.

20           6. A radio transmission apparatus for performing radio transmission by use of carrier frequencies, comprising:

signal processing systems, each including a signal generator configured to generate a signal having one of the carrier frequencies, an amplifier configured to amplify the

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signal generated by said signal generator, and a variable band-pass filter configured to receive an output signal from said amplifier and to pass the signal having said one of the carrier frequencies;

5        a filter controller configured to control a pass band of each variable band-pass filter according to each respective signal having one of the carrier frequencies and generated by a respective signal generator;

10       a combiner configured to combine signals output from the variable band-pass filters of said signal processing systems into a transmission signal;

      a fault detector configured to detect a fault of each variable band-pass filter; and

15       a transmission controller configured to stop an operation of a signal processing system having said signal generator, said amplifier, and said variable band-pass filter upon detection of a fault of said variable band-pass filter.

20       7. The radio transmission apparatus according to claim 6, further comprising:

      a controller configured to vary a bandwidth of the pass band of at least one of said variable band-pass filters according to a transmission rate of said transmission signal.

8. The radio transmission apparatus according to claim 6, wherein each variable band-pass filter is a superconductive filter.

5        9. The radio transmission apparatus according to claim 8, further comprising refrigerators each containing at least one of said superconductive filters.

10       10. The radio transmission apparatus according to claim 9, further comprising:

        a power monitor that monitors a power of each signal output from each amplifier;

        a temperature monitor that monitors a temperature of each superconductive filter; and

15       a controller that controls an operation of said refrigerators based on the powers monitored by said power monitor and the temperatures monitored by said temperature monitor.

20       11. The radio transmission apparatus according to claim 9, further comprising:

        a temperature monitor that monitors a temperature of each superconductive filter; and

25       a controller that controls an operation efficiency of said refrigerators based on a signal output timing of the

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amplifiers and the temperatures monitored by said temperature monitor.